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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/719,803	11/21/2003	Himanshu Pokharna	42P17130	3345

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EXAMINER

EDWARDS, ANTHONY Q

ART UNIT	PAPER NUMBER
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2835

DATE MAILED: 04/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/719,803

Applicant(s)

POKHARNA ET AL.

Examiner

Anthony Q. Edwards

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 14-20 and 22-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 14-20 and 22-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "plurality of evaporators" and a "pump coupled to a plurality of evaporators" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-11, 14-20 and 22-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically, claims 1, 9, 15 and 20 recite the combination wherein "components comprise a display circuitry and a central processing system (CPU)" and "a plurality of evaporators coupled to the components to remove heat from the components." Applicant, therefore, is attempting to claim an evaporator coupled to the display circuitry to "remove heat from the component." Applicant's original specification is silent, however, to this newly claimed combination. As indicated in paragraphs [0017-0018] of applicant's specification, "forced convection" is utilized to remove heat from the "display circuitry."

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 1, 2, 4-7, 20 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,510,052 to Ishikawa in view of U.S. Patent No. 5,255,109 to Klein. Referring to claim 1, Ishikawa discloses a notebook computer system, comprising a first heat sink (32) to passively dissipate heat from the notebook computer system, a sensor system (91a, 91b) to monitor a temperature of a plurality of components (see Fig. 3), wherein the components comprise a display (3), inherently including display circuitry, and a CPU (12), and a second heat sink (71) coupled to the first heat sink, wherein the second heat sink is enabled if the notebook computer system detects that at least one the components of the notebook computer system exceeds a predefined temperature threshold. That is, the passive heat sink (32) and display circuitry (not shown) combine to produce a heat energy value (i.e., temperature). Therefore, the heat sensor (91b) monitors a composite temperature of the display. See Figs. 3, 11 and 12, as well as col. 12, lines 57-65. Ishikawa also teaches providing at least one evaporator (31) coupled to a system component, i.e., CPU (12). See col. 8, lines 34-40. Ishikawa does not specifically teach providing a plurality of evaporators.

Klein teaches a heat dissipation system for a laptop computer LCD display having display circuitry (18), wherein an evaporator or evaporator material (14) is provided in the rear of the display to conduct heat away from the LCD display (12). See Fig. 1 and col. 2, lines 19-28.

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the system of Ishikawa to include evaporator material coupled to a display having display circuitry, as taught by Klein, since the device of Klein would

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reduce the amount of transient heat emanating from a particular area of display circuitry of Ishikawa, thereby reducing any inconsistent contrast and color shift caused by heat emanating from that area.

Referring to claim 2, Ishikawa in view of Klein disclose the notebook computer system as claimed, except for the first heat sink dissipating approximately 2-20 watts of power. It has been held that it is not inventive to discover the optimum or workable ranges by routine experiment (see MPEP 2144.05; *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)).

It would have been obvious, therefore, to one of ordinary skill in the art at the time of the invention to further modify the device of Ishikawa to limit the amount of heat dissipated from the first heat sink to within 2-20 watts of power, since monitoring and controlling the amount of heat dissipated from the first heat sink provides a benchmark for monitoring and controlling thermal management of the entire system.

Referring to claim 4, Ishikawa in view of Klein disclose a notebook computer system, wherein the first heat sink (32) passively dissipates heat through a display (3). See col. 12, lines 37-44 of Ishikawa.

Referring to claims 5 and 6, Ishikawa in view of Klein disclose a notebook computer system, wherein the display (3) comprises a first plate (43a) coupled to a second plate (43b), the second plate comprising a second groove (see Fig. 10 of Ishikawa), wherein a working fluid for heat transfer is distributed across the surface area of the display through grooves (45) between the first plate and the second plate, and wherein the grooves (45) between the first plate and second plate has a plurality of

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turns (44) to improve temperature spreading, respectively. See Fig. 3 and col. 12, lines 37-41 of Ishikawa. Although a first groove in the first plate is not specifically taught, it would have been obvious to one having ordinary skill in the art of heat dissipation plates with tubes or grooves to includes a first and second groove, since such a modification would have involved a mere change in shape of a component. A change in shape is generally recognized as being within the level of ordinary skill in the art. *In re Daily*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

Referring to claim 7, Ishikawa in view of Klein disclose the notebook computer system as claimed, except for both the first and the second plates being approximately one millimeter thick. It has been held that "in considering the disclosure of the reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom" (see MPEP 2144.01; *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968)).

It would have been obvious to one of ordinary skill in the art at the time of the invention to make further modify the device of Ishikawa to make both the first and second plates of Ishikawa approximately one millimeter thick, since such thin plates (e.g., approximately one millimeter thick) would provide sufficient structural support for the circulating paths or grooves of the heat sink in the display, while also providing the structure in a light weight form.

Referring to claim 20, Ishikawa in view of Klein discloses a thermal management system, comprising means for cooling a notebook computer passively (32), means for

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detecting a temperature of a plurality of notebook computer system components, wherein the components include a display (3), inherently including display circuitry, and a CPU (see Fig. 3 and the corresponding specification of Ishikawa), means for removing heat from the components using a plurality of evaporators coupled to the components (see Fig. 3 of Ishikawa and Fig. 1 of Klein), and means for cooling the notebook computer system actively if a component of the computer system exceeds a threshold temperature (see Figs 3, 11 and 12, as well as col. 12, lines 57-65 of Ishikawa).

Referring to claim 22, Ishikawa in view of Klein inherently disclose a thermal management system, further comprising means for increasing a life of a battery of the notebook computer system, since the fan control according to Fig. 12 of Ishikawa would increase the life of the battery.

Referring to claim 23, Ishikawa in view of Klein inherently disclose a thermal management system, further comprising means for spreading a working fluid temperature across a display (3) of the notebook computer system. See col. 12, lines 37-44 of Ishikawa.

Referring to claim 24, Ishikawa in view of Klein inherently disclose a thermal management system, further comprising means for pumping (76) a working fluid through the notebook computer system. See col. 11, lines 11-53 of Ishikawa.

Claims 9, 10, 14-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa in view of Klein, and further in view of U.S. Patent No. 6,657,121 to Garner. Referring to claim 9, Ishikawa in view of Klein disclose the method as substantially claimed, including a pump (76) coupled to at least one

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evaporator (31). See Fig. 3 and col. 11, lines 11-20 of Ishikawa. Ishikawa, as modified, does not disclose the pump coupled to a plurality of evaporators. Garner teaches providing a plurality of evaporating plates (70) to remove heat from a plurality of computer components (15) in a closed-loop system. See Figs. 2 and 3 and col. 5, lines 48-51.

It would have been obvious, therefore, to one of ordinary skill in the art at the time of the invention to further modify the device of Ishikawa to provide a plurality of evaporators, as taught by Garner, since the device of Garner would allow for the removal of heat from additional electronic devices within the base of Ishikawa, utilizing the pump of Ishikawa.

Referring to claim 10, Ishikawa, as modified, in view of Garner disclose a method further comprising monitoring a power consumption of a central processing unit. See col. 7, lines 36-38 of Ishikawa.

Referring to claim 14, Ishikawa, as modified, in view of Garner disclose a method, wherein the display (3) comprises a screen (18), inherently compromises circuitry, and comprises a cover (57), wherein heat passively dissipates through the display cover. See col. 12, lines 45-50 Ishikawa.

Referring to claim 15, Ishikawa, as modified, in view of Garner disclose a thermal management system of a notebook computer system as claimed, including a pump (76) coupled to a plurality of evaporators to transport the working fluid from the evaporators (see the rejection to method claim 9 above), as well as a fan (90) removing heat from the working fluid in the heat exchanger if at least one of the heat generating

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components exceed a predefined temperature threshold, and a display (3) coupled to at least one of the evaporators (see Fig. 1 of Klein), wherein the working fluid is spread across the surface area of the display to dissipate heat. See Figs. 3 and 11, as well as col. 11, lines 1-53 of Ishikawa.

Referring to claim 16, Ishikawa, as modified, in view of Garner disclose the notebook computer system as claimed, except for the first heat sink dissipating approximately 2-20 watts of power. However, as indicated above, it has been held that it is not inventive to discover the optimum or workable ranges by routine experiment (see MPEP 2144.05; *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)).

Referring to claim 17, Ishikawa, as modified, in view of Garner disclose a thermal management system, further comprising a hinge (52) to transfer the working fluid from the heat exchanger to the display, wherein the hinge comprises flexible tubing. See Fig. 4 and col. 9, lines 57-62 of Ishikawa.

Referring to claim 19, Ishikawa, as modified, in view of Garner disclose a thermal management system, wherein the working fluid comprises water. See col. 9, lines 53-56 of Ishikawa.

Claims 3 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa in view of Klein, and further in view of U.S. Patent Application Publication No. US2004/0095721 to Ellsworth, Jr. et al. ("Ellsworth" hereinafter). Referring to claim 3, Ishikawa, as modified, discloses the invention as claimed, except for the second heat sink being enabled if the notebook computer system exceeds a predefined power consumption threshold. Ellsworth teaches providing an auxiliary heat removal system

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(210) or (310), which is enabled when predefined power consumption of a heat source (240) is reached. See Fig. 2 and paragraph 0032, second column of the page 3.

It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the system of Ishikawa to provided a heat sink or heat removal system that is enabled when predefined power consumption of a component is reached, as taught by Ellsworth, since the device of Ellsworth would increase the coefficient of performance of the cooling system of Ishikawa in view of Klein by simply monitoring both the power and the temperature output of the heat producing component.

Referring to claim 11, Ishikawa, as modified, in view of Ellsworth disclose a method further comprising disabling the fan (310) if the power consumption of the CPU is less than a predefined power threshold. See Fig. 2 and paragraph 0032, second column of the page 3 of Ellsworth.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa in view of Klein, and further in view of U.S. Patent No. 6,181,555 to Haley et al.

Ishikawa, as modified, discloses the invention as claimed, except for further comprising an insulation layer to protect display circuitry from heat emanating from the first plate and the second plate. Haley et al. teach providing an insulation layer (102), between an LCD panel (101) and a thermo-plate or heat sink (104) to protect display circuitry in the LCD panel (101). See Fig. 2 and col. 3, lines 12-20 of Haley et al.

It would have been obvious to one of ordinary skill in the art at the time of the invention further modify the device of Ishikawa to provide the notebook computer

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system with an insulation layer between the LCD panel and the combined first sink, as taught by Haley et al., since the device of Haley et al. would provide protection for sensitive components in the display of Ishikawa, as modified, against heat dissipating from the portion of the first heat sink facing the display.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa in view of Klein, and further in view of U.S. Patent No. 4,688,147 to Ono. Ishikawa, as modified, discloses the invention as claimed, except for wherein the hinge comprises metal tubing to provide a hermetic seal. Ono teaches providing a flexible tube for a cooling device, having both an exterior metal bellows (5) and an interior surface wall 6c. See Fig. 3, as well as col. 3, lines 9-20.

It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the hinge having a flexible tubing of Ishikawa to include an exterior metal bellows, as taught by Ono, since the device of Ono would provide the hinge of Ishikawa, as modified, with an exterior surface that prolongs the lifespan of the hinge, and also provides for an hermetic seal in case the flexible tubing degrades prematurely.

Response to Arguments

Regarding the preliminary matter raised by the Applicant on page 2 of the Remarks, the Examiner regrets the omission of the formal rejection to claims 10, 11 and 18 in the previous Office Action, as well as the obvious typographical error relating to claims 14-17 and 19. Applicant's comments with respect to the Ghosh reference are therefore moot.

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Likewise, Applicant's arguments with respect to claims 1, 9, 15 and 20 have been considered but are moot in view of the new ground(s) of rejection.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Q. Edwards whose telephone number is 571-272-2042. The examiner can normally be reached on M-F (7:30-3:00) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn D. Feild can be reached on 571-272-2800, ext. 35. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

April 12, 2006
aqe


LYNN D. FEILD
PRIMARY EXAMINER